



**City of
Las Vegas**
Initial Public Meeting
**Water System Evaluation
and
Preliminary
Engineering Report**
September 21, 2010





AGENDA

- **Introductions**
- **Purpose of Meeting**
- **Overall Project Description**
- **Major Objectives**
- **Consultant Presentations**
 - **Water Rights**
 - **Groundwater, Wells**
 - **Surface Water, Dam Structures**
 - **Treatment, Distribution, Storage, Re-use**
- **Feedback / Comments**





INTRODUCTIONS

- CITY OF LAS VEGAS
 - MAYOR: Alfonso E. Ortiz, Jr.
 - COUNCIL MEMBERS:
 - Tonita Gurule-Giron
 - Diane Moore
 - Andrew Feldman
 - David Romero
 - CITY MANAGER: Timothy Dodge
 - UTILITY DIRECTOR: Ken Garcia
 - PROJECT MANAGER: Ben Ortega (505) 426-3220





CONSULTANTS

CHUDNOFF CONSULTING

Mustafa Chudnoff

- Water Rights
- Potable & Reuse Demand Patterns

WHPACIFIC / URS

Tod Phinney, P.E.

- Surface Water Diversion
- Dam Structures

DANIEL B. STEPHENS

John Kay, P.G.

- Well (Capacity, Locating, Design)
- Groundwater Modeling

MOLZEN CORBIN

Ron Mosher, P.E.

- Advanced Water Treatment
- Transmission / Distribution
- Treated Water Storage/Pumping
- Reuse Water

SOUDER MILLER & ASSOCIATES

Francisco (Kiko) Martinez, P.E.

- Project Coordination





PURPOSE OF MEETING

- Provide overview of the Project
- Obtain feedback from the Public and Stakeholders
- First of a series of public meetings
- Public input for Preliminary Engineering Report development



OVERALL PROJECT DESCRIPTION

Develop a Preliminary Engineering Report (PER) by conducting engineering investigations, studies and analysis to identify and prioritize alternatives and the preparation of cost estimates for the purpose of improving the City's water system infrastructure.



MAJOR OBJECTIVES

- Evaluate existing and potential future water demands, water rights and supply
- Evaluate existing system infrastructure components and future expansion / improvements
- Provide a basis for developing other related improvement plans, i.e. financial plans, leak detection, meter replacement, conservation, and drought contingency



WHY IS A PRELIMINARY ENGINEERING REPORT IMPORTANT?

- Is the necessary first step (“readiness to proceed”) required by project funding agencies, especially for major capital projects that require multiple state and federal funding agencies
- Provides a foundation and prioritization for efficient use of limited grant and public funding
- Provides the building blocks for developing a road map to achieve consistent and well thought out capital improvement plans



ELEMENTS OF A PRELIMINARY ENGINEERING REPORT

- **Defines the Project Planning Area**
 - Current Regional Water Service Area
 - Includes areas outside the City Limits
 - Infrastructure within the project planning area evaluated for short-term solutions (immediate to the next 5 years)
 - Infrastructure evaluated for long term solutions (up to 40 years)



ELEMENTS OF A PRELIMINARY ENGINEERING REPORT (CONT'D)

- **Evaluation of Existing Facilities**
 - Each consultant will evaluate the condition and performance of the existing facilities in their evaluation area
- **Need for Project**
 - Each consultant will assess the need for the project based on their evaluation of the condition and performance of the existing facilities



ELEMENTS OF A PRELIMINARY ENGINEERING REPORT (CONT'D)

- **Alternatives To Be Considered**
 - Consultants will propose projects for upgrading and improving facilities in their evaluation area to meet:
 - Existing and future water demands
 - Improve the condition and efficiency of facilities
 - Develop alternatives for short and long term solutions



ELEMENTS OF A PRELIMINARY ENGINEERING REPORT (CONT'D)

- **Selection of Alternatives**
 - Alternatives for each project will be scored and ranked based on monetary and non-monetary criteria
 - A recommended Alternative for each project will be chosen based on the highest ranking
 - Selected Alternative may be phased for implementation of project



CONSULTANT PRESENTATIONS

- **Water Production and Rights:** Mustafa Chudnoff Consulting
- **Groundwater Supply:** Daniel B. Stephens – John Kay
- **Raw Water Supply and Storage:** WHPacific – Tod Phinney, P.E.
- **Finished Water System and Storage:** Molzen-Corbin – Ron Mosher, P.E.
- **Reuse:** Molzen-Corbin – Ron Mosher, P.E.

WATER PRODUCTION AND RIGHTS

- MUSTAFA CHUDNOFF CONSULTING



WATER PRODUCTION, USE & CONSERVATION

- **Objectives**

- Prepare a 40-Year Water Development Plan (2010-2050)
- Develop key planning numbers in support of PER engineering effort
- Secure the City's water rights by demonstrating need

- **Constraints**

- 2,745 acre-feet of surface water rights
- 1,500 acre-feet of groundwater rights
- City required to return 24% of diversions to hydrologic system
- Other water users



WATER PRODUCTION, USE & CONSERVATION

- **Key Work Elements**

- Analysis of river diversions vs. Water Treatment Plant (WTP) production
- Analysis of WTP production vs. metered sales
- Analysis of monthly/seasonal water use patterns
- Analysis of wastewater production and availability for reuse
- Calculation of Per Capita Water usage by categories
- Use historic water use patterns and 40-Yr. population projections to estimate water demand and wastewater production.



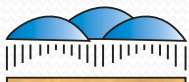
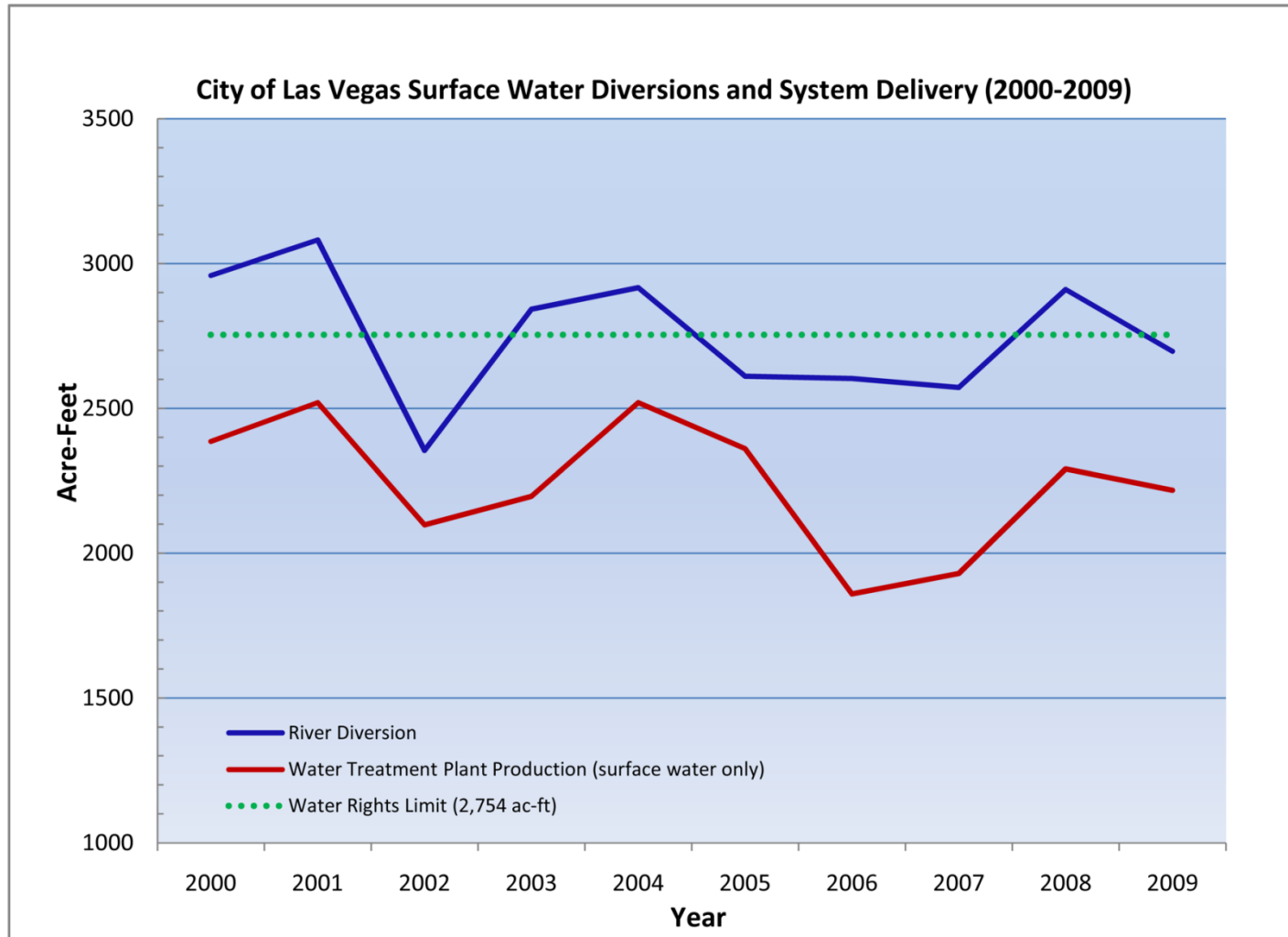
WATER PRODUCTION, USE & CONSERVATION

- **Conclusions & Recommendations (Preliminary)**

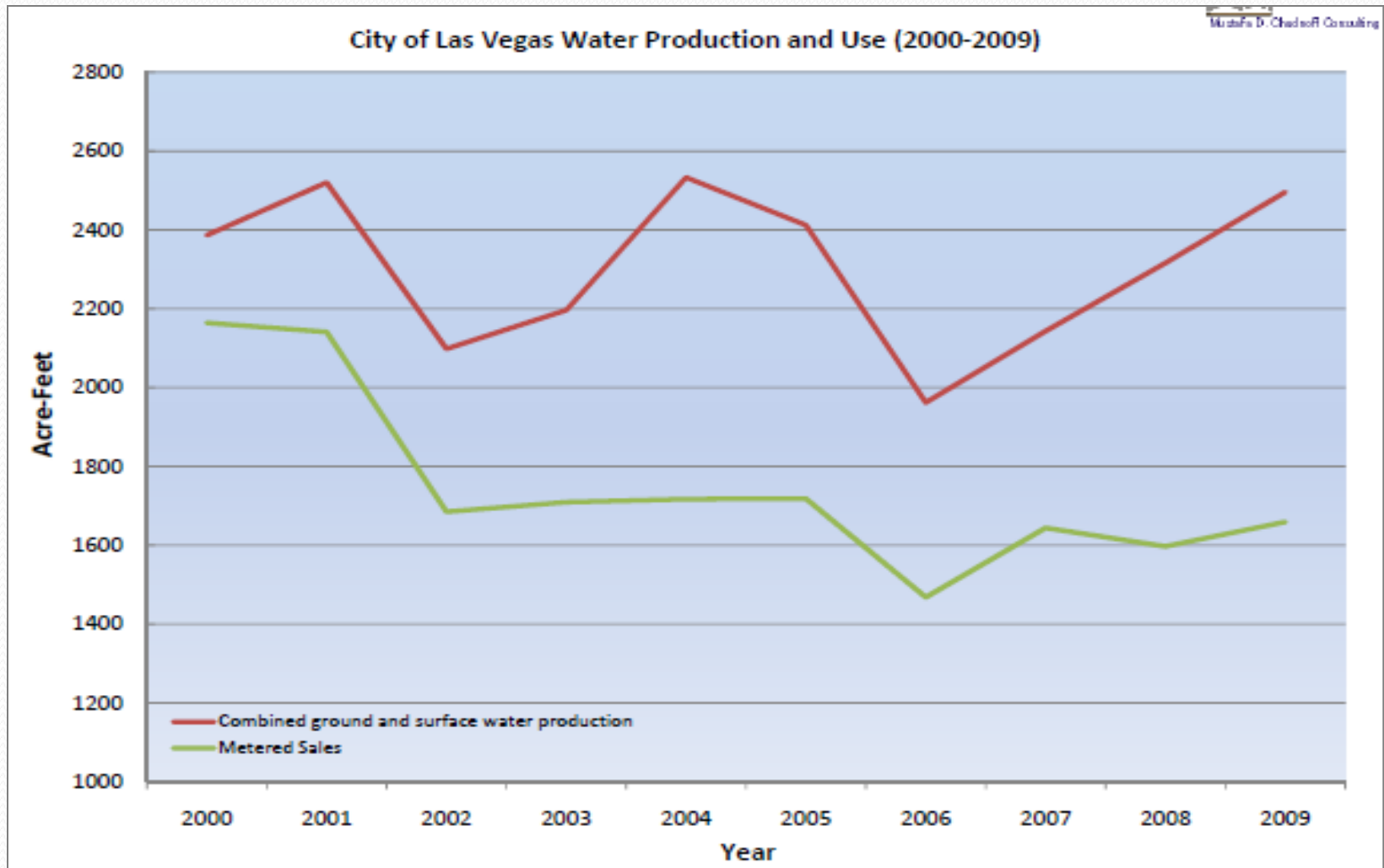
- Approximately 20% raw water system losses (reservoir evaporation & leakage, pipe leaks)
- Approximately 25% “apparent” and “real” distribution system losses (e.g. pipe leaks, meter under-registration); City should focus on testing & replacement of commercial meters and replacement of older distribution line
- Residential per capita water use (GPCD) is between 50-60 gallons per day – OSE and industry standard is 60 gpcd
- City should evaluate cost/benefit of capturing wastewater from “water only” county customer accounts



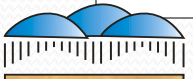
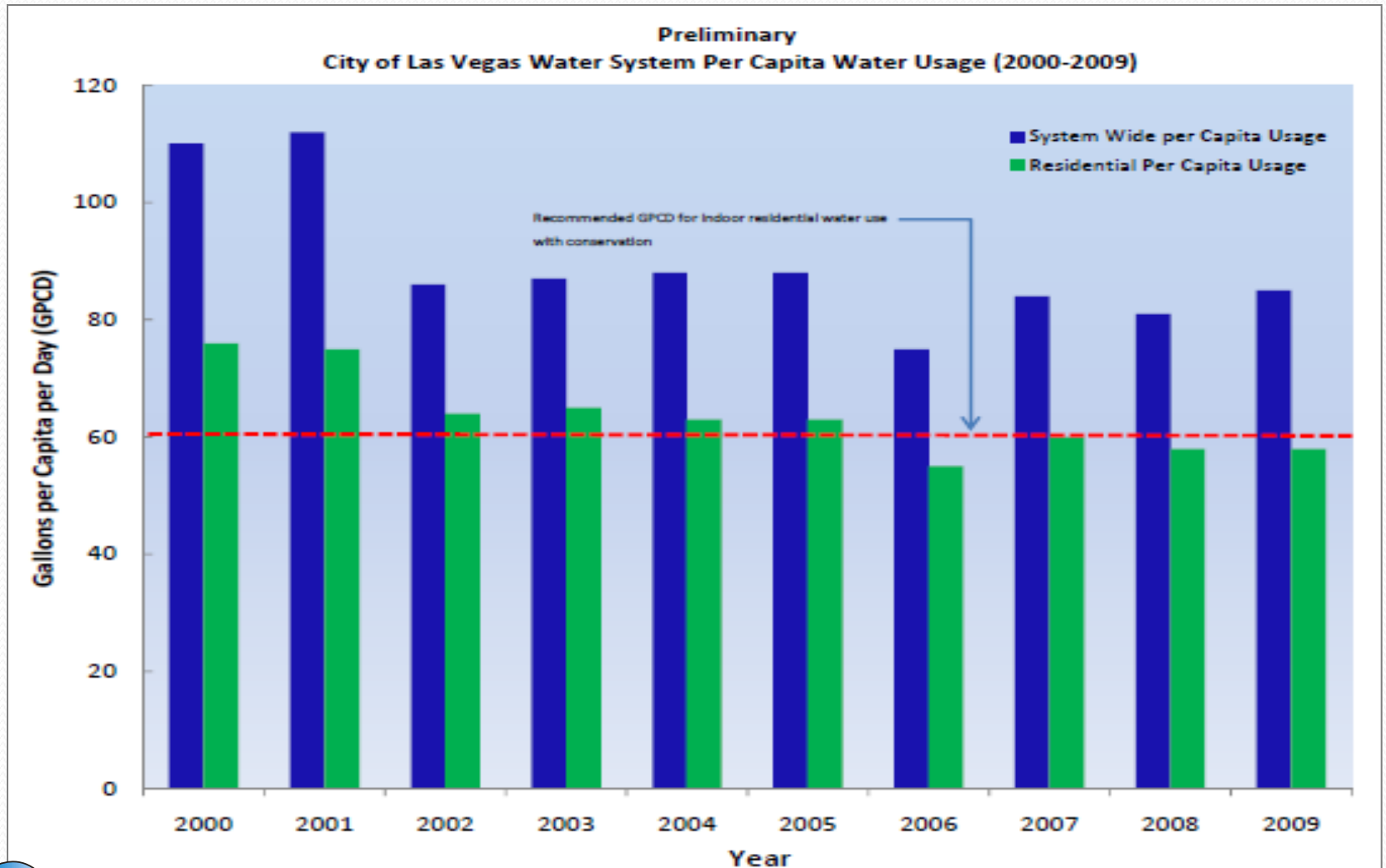
WATER USAGE



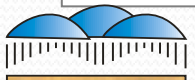
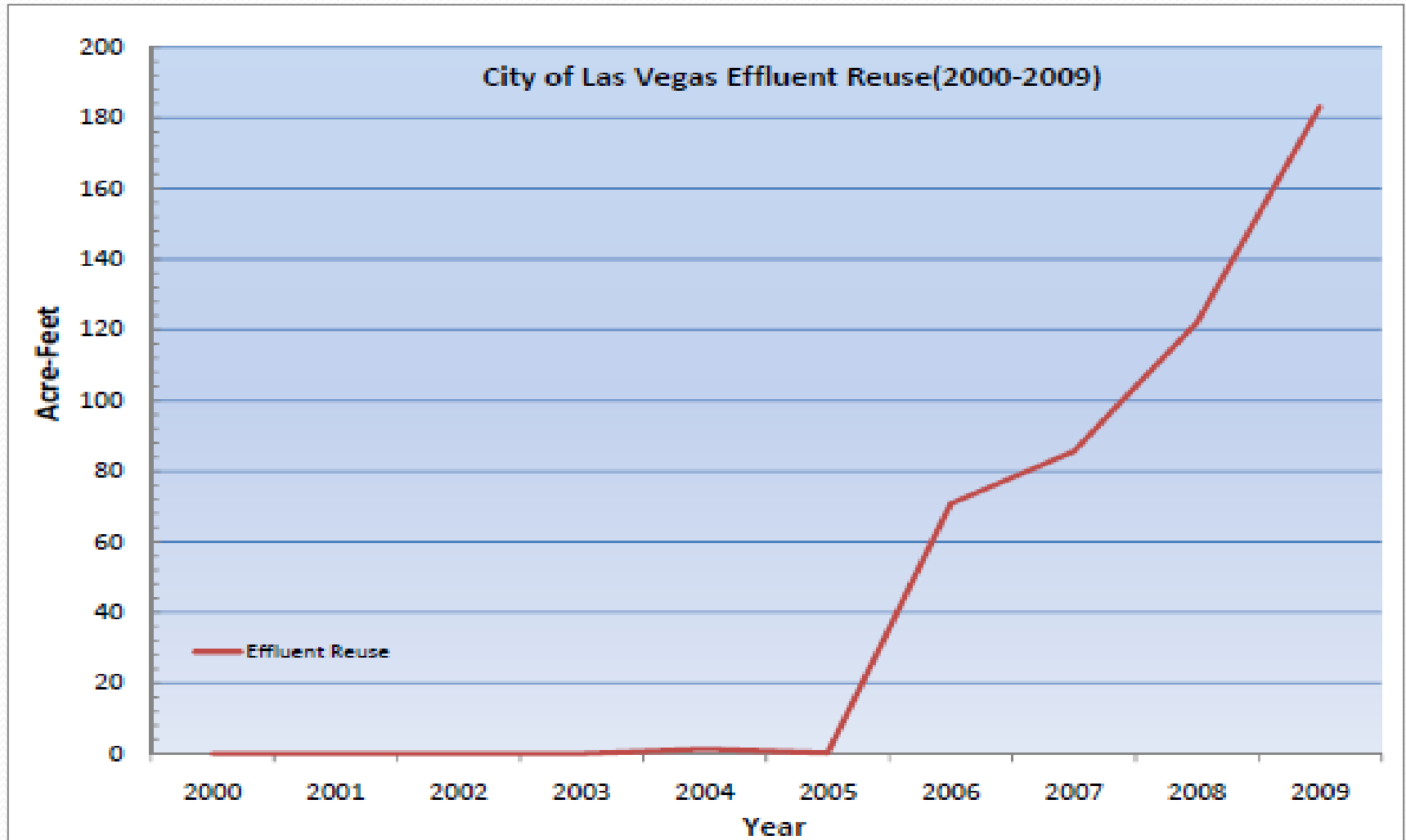
WATER PRODUCTION



PRELIMINARY PER CAPITA WATER USAGE



EFFLUENT REUSE



GROUNDWATER SUPPLY

- DANIEL B. STEPHENS & ASSOCIATES, INC.



GROUNDWATER SUPPLY

- **Objectives:**

- Evaluate existing ground water sources and develop plan to supplement the surface water supply
- Investigate other groundwater sources to supplement the present and future water supply
- Assist the City in developing a drought contingency plan utilizing the groundwater supply



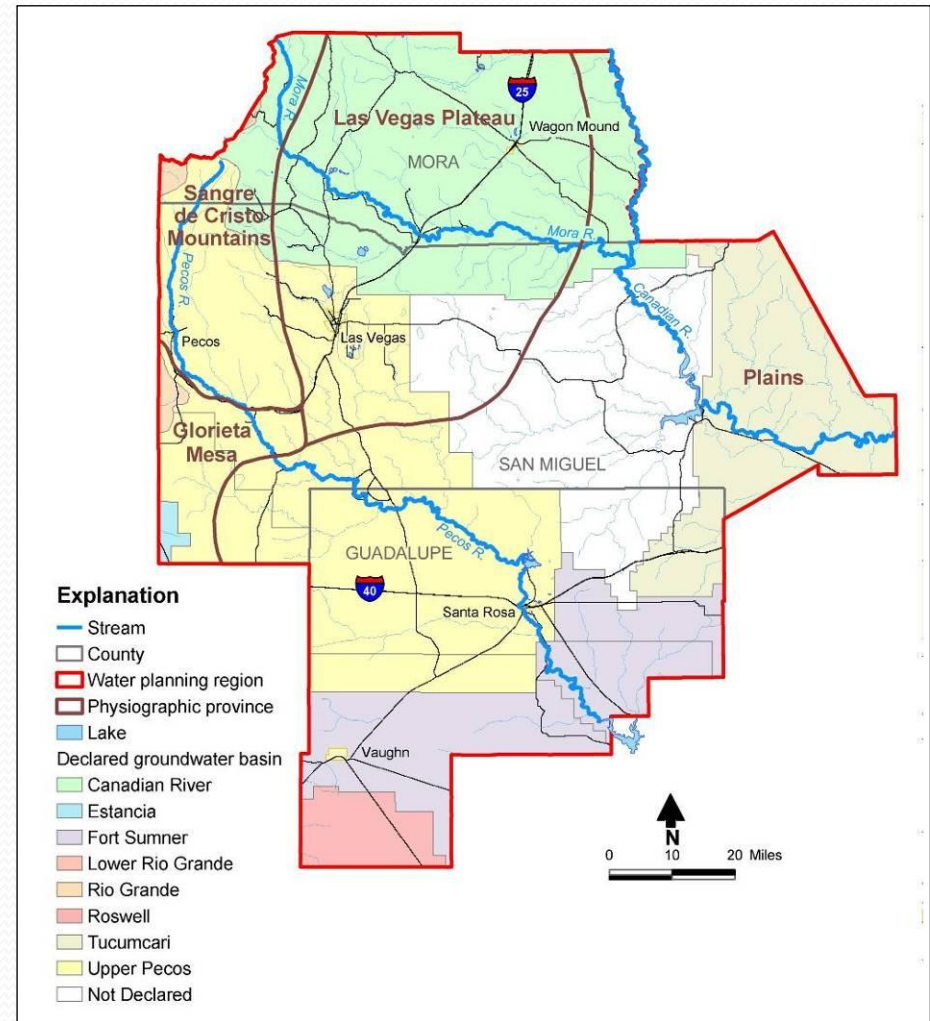
GROUNDWATER SUPPLY

- Groundwater (GW) needed to augment water supply and for drought contingency
- City owns 1,500 acre-ft of water rights
 - Currently associated with the Taylor Wellfield
 - Could possibly be transferred to other areas



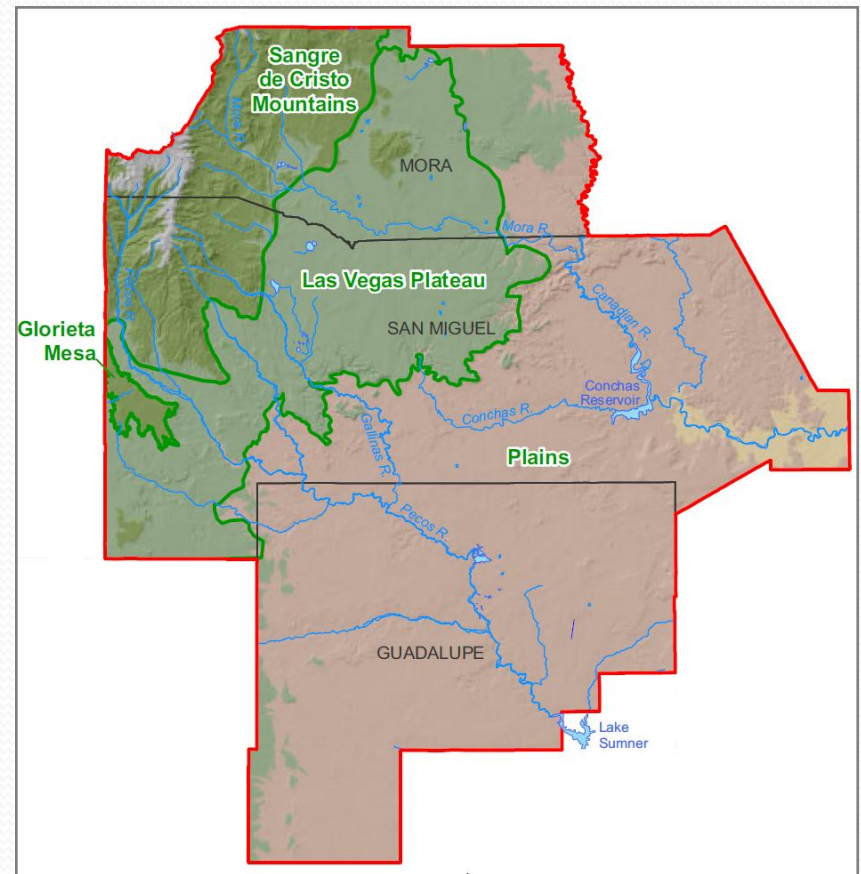
REGIONAL GROUNDWATER SUPPLY

- Region has seven OSE declared groundwater basins.
- Potable sources are considered to be fully appropriated.
- Water right transfers required for potable water development.

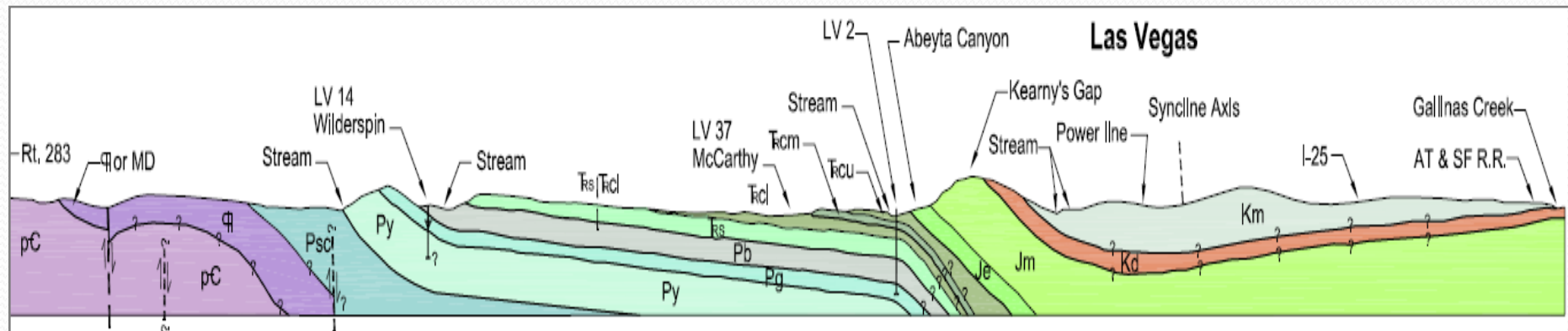


REGIONAL GROUNDWATER SUPPLY

- **Sangre de Cristo Mountains:** pre-Cambrian rocks, Sandia / Madera / Sangre de Cristo Fm.
- **Glorieta Mesa:** Paleozoic sedimentary rocks, Yeso / Glorieta / Santa Rosa Fm.
- **Las Vegas Plateau:** Mesozoic sedimentary rocks, Dakota / Morrison / Entrada Fm.
- **Plains:** Triassic Chinle Fm. and Santa Rosa Sandstone

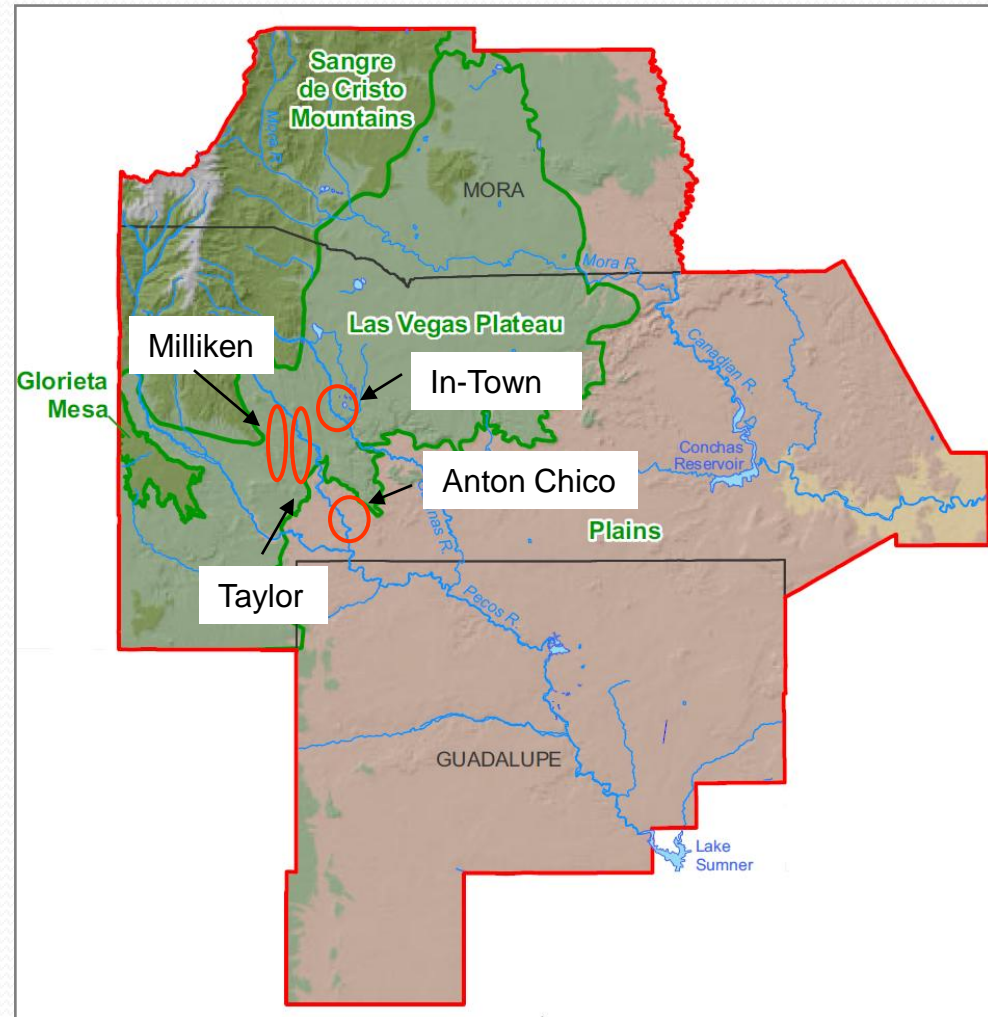


HYDROGEOLOGIC SETTING



LOCAL GROUNDWATER SOURCES

- Taylor Wellfield
- In-town deep wells
- In-town reuse wells
- Milliken Ranch
- Anton Chico



TAYLOR WELL FIELD

- Constructed mid- 1950s
- Fractured rocks provide high yield, >200 gpm / well
- Only Well No.4 operational, 350 gpm
- Well No. 2 being replaced in 2011



IN-TOWN WELLS

Rodriguez Park

- 2,600 ft. deep
- Tested Dakota, Entrada, Chinle, Santa Rosa, & Glorieta
- Low yield of ~ 5 gpm
- Non-potable quality

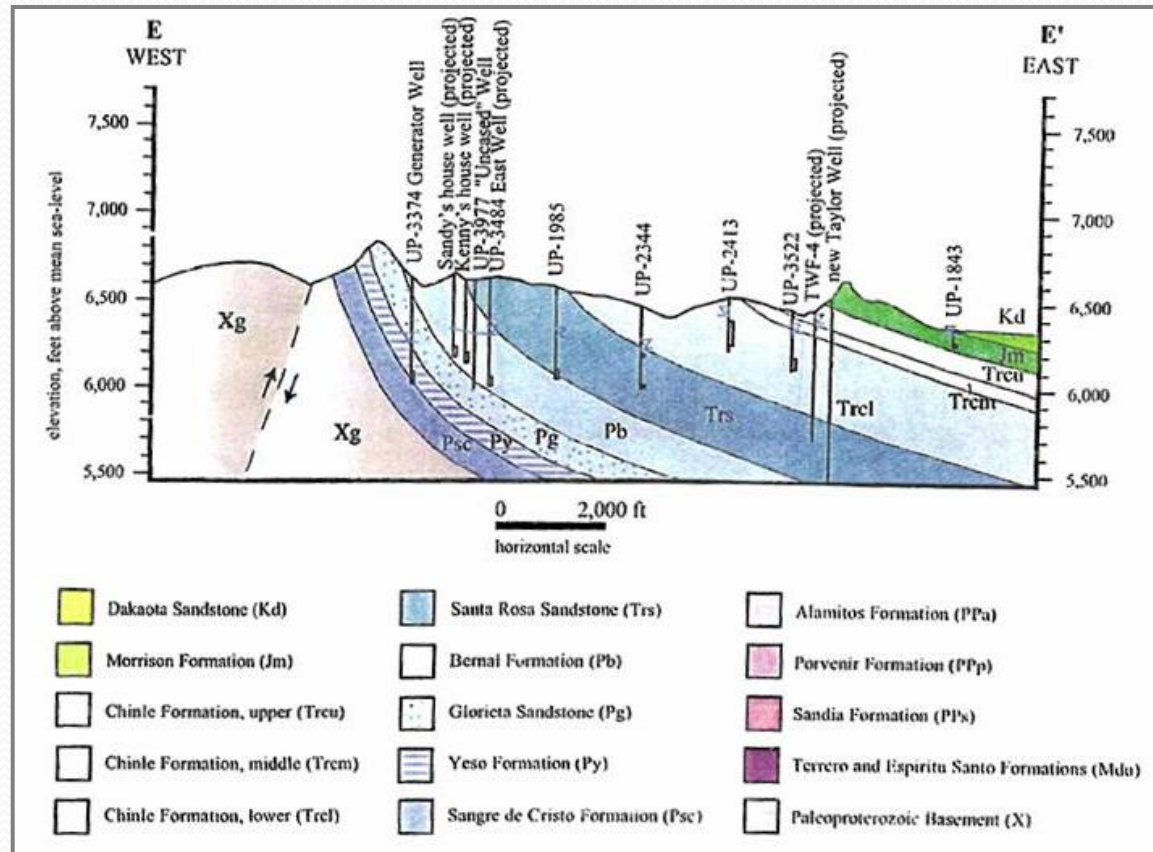
Highland Golf Course

- 1,200 ft. deep
- Completed in Dakota & Morrison
- Moderate yield of ~50 gpm
- Potable quality 500 mg/L TDS



MILLIKEN RANCH AREA

- 600-850 ft. deep
- Same units as Taylor Wells
- High yields up to 900 gpm
- Potable quality
- More costly



OTHER POSSIBLE GW SOURCES

- Wastewater Reuse
 - Irrigation
 - Indirect potable reuse
- Santa Rosa/Anton Chico
 - Possible Santa Rosa water available?
 - Would require ~30 mile pipeline from Anton Chico area
- Brackish Water



REMAINING WORK

- Determine extent to which Taylor Wellfield can be developed
- Determine quantity of other groundwater that can be obtained
- Evaluate quantity of water and cost per unit (acre-foot) from each potential source
- Identify project for developing full 1,500 acre-foot water right



RAW WATER SYSTEM IMPROVEMENTS

- WHPACIFIC

RAW WATER SYSTEM IMPROVEMENTS

Objectives:

- To provide members of the public with an overview of the Raw Water System, and needed improvements.
- To address the following questions:
 - What does the Raw Water System Improvements PER & related projects include?
 - Why are they necessary?
 - Once completed, how will the City be better off?

RAW WATER PER & STORAGE ENGINEERING ANALYSIS

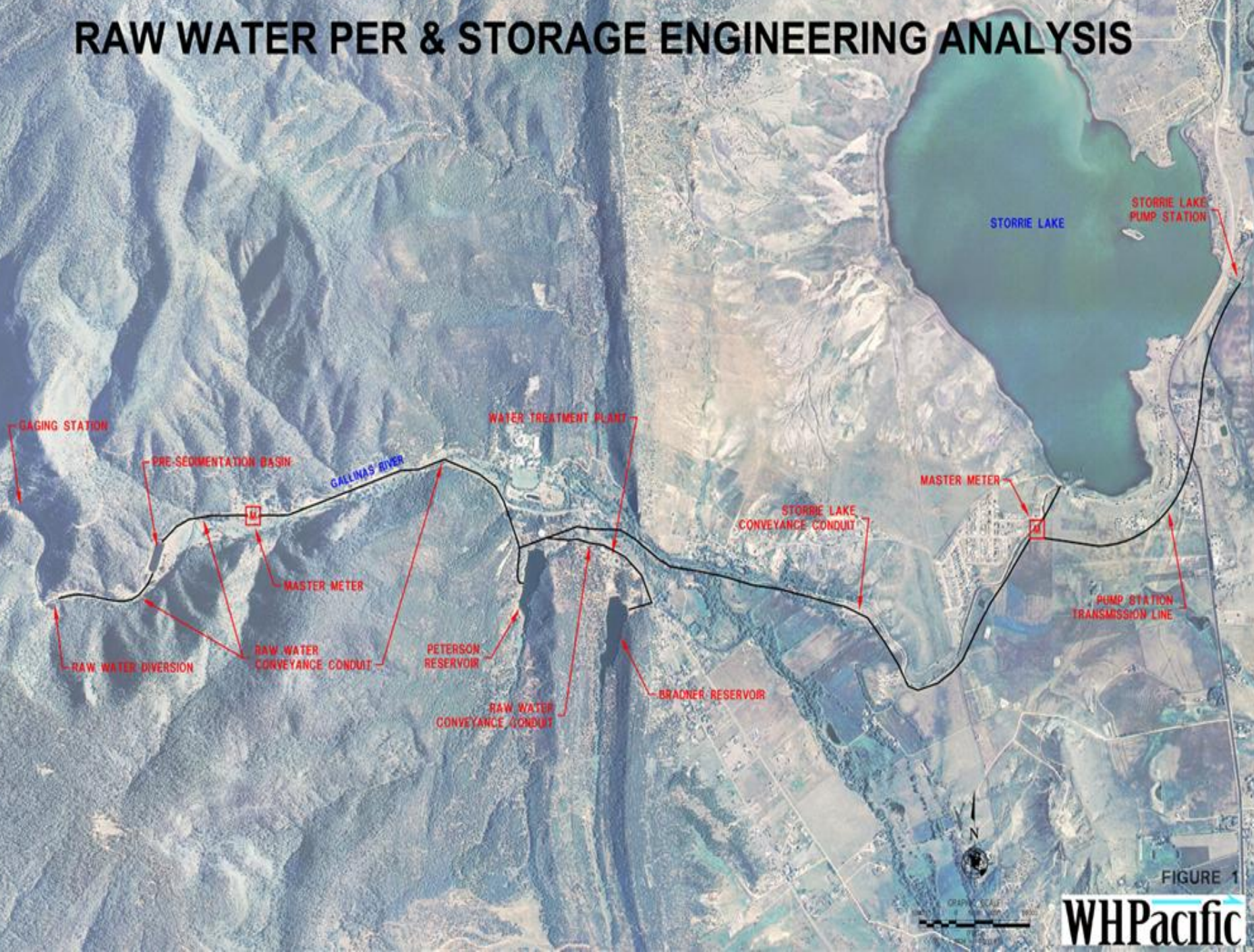


FIGURE 1

RAW WATER SYSTEM IMPROVEMENTS PER

- **Description:** The project entails **engineering investigations, studies and analysis to identify and prioritize alternatives, and prepare cost estimates to improve the raw water diversion, conveyance, and storage of water captured from the Gallinas River.** This report will serve as the basis for seeking funding from various sources.
- **Drivers:** Perpetual shortage and inadequate storage capacity of raw water supply, and deteriorated infrastructure, some of which is beyond its useful service life.

GALLINAS DIVERSION STRUCTURE RENOVATION



GALLINAS DIVERSION STRUCTURE RENOVATION

- Project is Funded by a \$1.25M Grant
- Design Improvements include:
 - Coanda screen for debris removal
 - Pedestrian Bridge for safe maintenance access
 - Motorized Control Valve for better flow control
 - Currently 35% complete; design completion ~Dec. 2010
- Construction planned for 2011

PETERSON DAM PHOTOS



PETERSON DAM PHOTOS



PETERSON DAM PHOTOS



PETERSON DAM

STRUCTURAL STABILITY ANALYSIS

- **Description:** This project entails the preparation of a Structural Stability Analysis Report.
- **Driver:** The work is necessary to address the OSE required action to “Obtain engineering analysis of dam integrity in its present and anticipated future condition and stability of dam and foundation with respect to an extreme flood event”, as stated in OSE letter dated July 7, 2009.

BRADNER DAM PHOTOS



BRADNER DAM PHOTOS



BRADNER RESERVOIR



PETERSON RESERVOIR



COST ANALYSIS FOR STORAGE CAPACITY ENLARGEMENT OF BRADNER AND/OR PETERSON RESERVOIRS

- **Description:** This project involved developing conceptual construction costs to increase the raw water storage capacity at Peterson and/or Bradner Reservoirs by 500 acre-feet.
- **Driver:** The work was necessary to develop conceptual construction estimates for use by the City to pursue funding options.

COST ANALYSIS FOR STORAGE CAPACITY ENLARGEMENT OF BRADNER AND/OR PETERSON RESERVOIRS

- **Work included:**
 - Reviewing historical data for Peterson and Bradner Dams
 - Evaluating the feasibility of adding storage at Peterson or Bradner Reservoirs, based on historical data
 - Preparing conceptual construction estimates for adding storage
- **Conceptual construction estimates as follows:**
 - 500 Acre-Feet at Peterson Reservoir = \$10.1 M or \$9.4M (RCC)
 - 500 Acre-Feet at Bradner Reservoir = \$10.6 M
 - 250 Acre-Feet at Peterson & Bradner = \$14.5 M or \$14.0M (RCC)

FINISHED WATER FACILITIES

- MOLZEN-CORBIN

FINISHED WATER FACILITIES

- **Objectives:**

- Evaluate and assess the condition and current performance of the finished water system including treatment, distribution, storage, booster stations, and transmission system
- Evaluate the capacity of the finished water system based on existing and future water demands
- Evaluate the effluent reuse pumping and transmission system
- Make recommendations for short and long term solutions to the finished water and reuse systems

FINISHED WATER PER

- Surface Water Treatment Plant
- Water Distribution System
- Finished Water Storage Tanks
- Wells, Booster Pump and Transmission System
- Effluent Reuse Facilities

FINISHED WATER PER

- **Evaluation of Existing Facilities**

- An evaluation of the condition and performance of the existing surface water treatment plant
- A description of the existing Taylor well, booster pump station and transmission line
- An assessment of the condition of the existing finished water storage tanks
- Distribution system pressure and maintenance conditions
- A description of the existing reuse pump and transmission system

FINISHED WATER PER

- **Need for Project**

- Potential need to increase surface water treatment capacity and improvements to continue to meet drinking water regulations
- Upgrades to the storage tanks to address conditions and meet future demands and fire flow requirements
- Distribution system upgrades for future demands
- Reduction of water losses
- Improvements to flow distribution among pressure zones

FINISHED WATER PER

- **Need for Project** (Cont'd.)
 - Expansion of the effluent reuse distribution system
 - Conversion of the reuse system to provide for multiple looped pressure zones
 - Modifications to allow for fully automatic operation of the reuse system

FINISHED WATER PER

- **Alternatives to be Considered**
 - Condition, efficiency and capacity improvements to the surface water treatment plant
 - Condition and capacity improvements to the distribution system, including computer modeling evaluations
 - Condition and capacity increases to finished water storage tanks

FINISHED WATER PER

- **Alternatives to be Considered (Cont'd)**
 - Upgrades and expansion of the water reuse system
 - Continue to irrigate City parks and expand system to serve more parks/ball fields
 - Coordinate with local Acequias to pump reuse water to Acequias for irrigation
 - Pump treated effluent to the Gallinas diversion canal and send water to Storrie Lake for blending, storage, then pumping to City's surface water treatment plant

FINISHED WATER PER

- **Alternatives to be Considered (Cont'd)**
 - Upgrades and expansion of the water reuse system (Cont'd)
 - Aquifer storage and recovery
 - Pump treated effluent to Peterson and Bradner reservoirs for blending with Gallinas River water and subsequent treatment in the City's surface water treatment plant.

FINISHED WATER PER

- **Selection of Alternatives**
 - Candidate alternatives will be evaluated through an impartial matrix scoring system involving monetary and non-monetary criteria to choose the recommended alternative in each project sub-phase

FINISHED WATER PER

- **Implementation**

- Develop a general plan for the implementation of the recommended projects
- Project prioritization will be developed, and a phasing plan will be recommended
- Having projects prioritized and part of a PER is key to government funding



NEXT STEPS

- Public and Stakeholders provide comment and feedback
- Consultants incorporate comments
- Develop selection matrix
- Present recommended alternatives to community
- Complete PER



FEEDBACK / COMMENTS